

- 1 1. A polypeptide comprising human papillomavirus E6 and E7 polypeptides,
2 wherein the E7 polypeptide has mutations at any one or more of the amino acids
3 corresponding to amino acids 24, 26 or 91 of SEQ ID NO: 14 and the E6 polypeptide has no
4 mutations or has mutations at any one or more of the amino acids corresponding to amino
5 acids 63 or 106 of SEQ ID NO: 13.
- 1 2. The polypeptide of claim 1 wherein the mutated amino acids are mutated
2 to glycine.
- 1 3. The polypeptide of claim 1 wherein the E7 polypeptide precedes the E6
2 polypeptide.
- 1 4. The polypeptide of claim 2 wherein the E7 polypeptide precedes the E6
2 polypeptide.
- 1 5. An isolated nucleic acid encoding the polypeptide of claim 1.
- 1 6. The nucleic acid of claim 5 wherein the nucleotide sequence of E7
2 precedes the nucleotide sequence of E6.
- 1 7. An expression vector comprising the nucleic acid sequence of claim 5
2 under the control of an expression control sequence.
- 1 8. A host cell comprising the nucleic acid of claim 5.
- 1 9. A host cell which expresses the polypeptide of claim 1.
- 1 10. A host cell comprising the expression vector of claim 7.
- 1 11. An immunogenic composition comprising:
2 (a) the polypeptide of claim 1; and
3 (b) a pharmaceutically acceptable carrier.

- 1 12. The immunogenic composition of claim 11 further comprising adjuvant.
- 1 13. An immunogenic composition comprising the nucleic acid of claim 5.
- 1 14. A recombinant virus comprising the nucleic acid of claim 5.
- 1 15. The recombinant virus of claim 14, wherein the virus is a modified
2 Venezuelan equine encephalitis virus.
- 1 16. A method for producing an immune response in an individual, which
2 method comprises administering to the individual the immunogenic composition of claim 11
3 in an amount sufficient to produce the immune response.
- 1 17. A method of treating cervical cancer, which method comprises
2 administering to a patient diagnosed with cervical cancer the immunogenic composition
3 according to claim 11 in an amount sufficient to produce a protective immune response.
- 1 18. A method of preventing cervical cancer, which method comprises
2 administering to an individual the immunogenic composition of claim 11 in an amount
3 sufficient to produce a protective immune response.
- 1 19. A method of preventing cervical cancer, which method comprises
2 administering to an individual the expression vector of claim 7 in an amount sufficient to
3 produce a protective immune response.
- 5 20. A method of treating cervical cancer, which method comprises
administering to a patient diagnosed with cervical cancer the expression vector of claim 7 in
an amount sufficient to produce a protective immune response.
- 1 21. The isolated polypeptide of claim 1 wherein the E7 polypeptide has
2 mutations in at least two of amino acids corresponding to amino acids 24, 26 and 91 of SEQ
3 ID NO: 14 and the E6 polypeptide has one or more mutations at amino acids corresponding
4 to amino acids 63 and 106 of SEQ ID NO: 13.
- 1 22. An isolated polypeptide comprising the amino acid sequence set forth in
2 SEQ ID NO: 3, SEQ ID NO: 5, SEQ ID NO: 9, or SEQ ID NO: 11

1 23. An isolated nucleic acid encoding a polypeptide comprising the amino
2 acid sequence set forth in SEQ ID NO: 3, SEQ ID NO: 5, SEQ ID NO: 9 or SEQ ID NO:
3 11.

1 24. The isolated nucleic acid of claim 23 having the nucleotide sequence as set
2 forth in SEQ ID NO: 4, SEQ ID NO: 6, SEQ ID NO: 10 or SEQ ID NO: 12.

1 25. An expression vector comprising the nucleic acid sequence of claim 23
2 under the control of an expression control sequence.

1 26. An expression vector comprising the nucleic acid sequence of claim 24
2 under the control of an expression control sequence.